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Will had day	_	_		-	-			_							ccg Pro	-	3116
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	_													g aad et Asi 91!	n Ile		3452	:
							Leu						er A	et gg la Gly 30			3500	}
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45 4A 4A											a Gl			to go eu Al		Ser	3644	ł
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To the that			atc Ile 1000	Asp	_	_		_	r G.					tac Tyr 1010	ccg Pro		3737	7
Mana Radi Mank			ggc Gly 1015	Tyr	_	tac Tyr	_	_	ı L	_	_			ctc Leu 1025	gtt Val	_	3782	2
		_	atc Ile 1030	His					G.					atg Met 1040	att Ile		3825	7
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Ser Trp Leu Ile Gly Thr Pro Glu Trp Arg Ala Arg Gln Lys Glu Glu
50 55 60

Phe Gly Glu Gly Ala Arg Val Thr Ser Gly Leu Glu Asn Ile Leu Glu 65 70 75 80

Glu Leu Ser Pro Ile Gln Asp Tyr Ser Gly Asn Met Ser Leu Ser Leu 85 90 95

Ser Glu Pro Arg Phe Glu Asp Val Lys Asn Thr Ile Asp Glu Ala Lys
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Glu Lys Asp Ile Asn Tyr Ala Ala Pro Leu Tyr Val Thr Ala Glu Phe 115 120 125

Val Asn Asn Thr Thr Gly Glu Ile Lys Ser Gln Thr Val Phe Ile Gly
130 135 140

Asp Phe Pro Met Met Thr Asp Lys Gly Thr Phe Ile Ile Asn Gly Thr 145 150 155

Glu Arg Val Val Ser Gln Leu Val Arg Ser Pro Gly Val Tyr Phe
165 170 175

Asp Gln Thr Ile Asp Lys Ser Thr Glu Arg Pro Leu His Ala Val Lys
180 185 190

Val Ile Pro Phe Arg Gly Ala Trp Leu Glu Phe Asp Val Asp Lys Arg 195 200 205

Asp Ser Val Gly Val Arg Ile Asp Arg Lys Arg Arg Gln Pro Val Thr 210 215 220

Val Leu Leu Lys Ala Leu Gly Trp Thr Thr Glu Gln Ile Thr Glu Arg

Phe Gly Phe Ser Glu Ile Met Met Ser Thr Leu Glu Ser Asp Gly Val 245 250 255

Ala Asn Thr Asp Glu Ala Leu Leu Glu Ile Tyr Arg Lys Gln Arg Pro 260 265 270

Gly Glu Gln Pro Thr Arg Asp Leu Ala Gln Ser Leu Leu Asp Asn Ser 275 280 285

Phe Phe Arg Ala Lys Arg Tyr Asp Leu Ala Arg Val Gly Arg Tyr Lys 290 295 300

Ile Asn Arg Lys Leu Gly Leu Gly Gly Asp His Asp Gly Leu Met Thr 305 310 315 320

Leu Thr Glu Glu Asp Ile Ala Thr Thr Ile Glu Tyr Leu Val Arg Leu 325 330 335

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1313

 His Ala Gly Glu Arg Val Met Thr Ser Pro Asn Gly Glu Glu Ile Pro $340 \hspace{1cm} 345 \hspace{1cm} 350$

Val Glu Thr Asp Asp Ile Asp His Phe Gly Asn Arg Arg Leu Arg Thr 355 360 365

Val Gly Glu Leu Ile Gln Asn Gln Val Arg Val Gly Leu Ser Arg Met 370 375 380

Glu Arg Val Val Arg Glu Arg Met Thr Thr Gln Asp Ala Glu Ser Ile 385 390 395 400

Thr Pro Thr Ser Leu Ile Asn Val Arg Pro Val Ser Ala Ala Ile Arg
405 410 415

Glu Phe Phe Gly Thr Ser Gln Leu Ser Gln Phe Met Val Gln Asn Asn 420 425 430

Ser Leu Ser Gly Leu Thr His Lys Arg Arg Leu Ser Ala Leu Gly Pro 435 440 445

Gly Gly Leu Ser Arg Glu Arg Ala Gly Ile Glu Val Arg Asp Val His
450 455 460

Pro Ser His Tyr Gly Arg Met Cys Pro Ile Glu Thr Pro Glu Gly Pro 465 470 475 480

Asn Ile Gly Leu Ile Gly Ser Leu Ala Ser Tyr Ala Arg Val Asn Pro 485 490 495

Phe Gly Phe Ile Glu Thr Pro Tyr Arg Arg Ile Ile Asp Gly Lys Leu 500 505 510

Thr Asp Gln Ile Asp Tyr Leu Thr Ala Asp Glu Glu Asp Arg Phe Val 515 520 525

Val Ala Gln Ala Asn Thr His Tyr Asp Glu Glu Gly Asn Ile Thr Asp 530 540

Glu Thr Val Thr Val Arg Leu Lys Asp Gly Asp Ile Ala Met Val Gly 545 550 555

Arg Asn Ala Val Asp Tyr Met Asp Val Ser Pro Arg Gln Met Val Ser 565 570 575

Val Gly Thr Ala Met Ile Pro Phe Leu Glu His Asp Asp Ala Asn Arg 580 585 590

Ala Leu Met Gly Ala Asn Met Gln Lys Gln Ala Val Pro Leu Ile Arg 595 600 605

Ala Glu Ala Pro Phe Val Gly Thr Gly Met Glu Gln Arg Ala Ala Tyr 610 620

Asp Ala Gly Asp Leu Val Ile Thr Pro Val Ala Gly Val Val Glu Asn 625 630 635 640

Val Ser Ala Asp Phe Ile Thr Ile Met Ala Asp Asp Gly Lys Arg Glu 645 650 655

Thr Tyr Leu Leu Arg Lys Phe Gln Arg Thr Asn Gln Gly Thr Ser Tyr 660 665 670

Asn Gln Lys Pro Leu Val Asn Leu Gly Glu Arg Val Glu Ala Gly Gln 675 680 685

Val Ile Ala Asp Gly Pro Gly Thr Phe Asn Gly Glu Met Ser Leu Gly 690 695 700

Arg Asn Leu Leu Val Ala Phe Met Pro Trp Glu Gly His Asn Tyr Glu 705 710 715 720

Asp Ala Ile Ile Leu Asn Gln Asn Ile Val Glu Gln Asp Ile Leu Thr 725 730 735

Ser Ile His Ile Glu Glu His Glu Ile Asp Ala Arg Asp Thr Lys Leu 740 745 750

Gly Ala Glu Glu Ile Thr Arg Asp Ile Pro Asn Val Ser Glu Glu Val 755 760 765

Leu Lys Asp Leu Asp Asp Arg Gly Ile Val Arg Ile Gly Ala Asp Val 770 780

Arg Asp Gly Asp Ile Leu Val Gly Lys Val Thr Pro Lys Gly Glu Thr 785 790 795 800

Glu Leu Thr Pro Glu Glu Arg Leu Leu Arg Ala Ile Phe Gly Glu Lys 805 810 815

Ala Arg Glu Val Arg Asp Thr Ser Met Lys Val Pro His Gly Glu Thr 820 825 830

Gly Lys Val Ile Gly Val Arg His Phe Ser Arg Glu Asp Asp Asp Asp 835 840 845

Leu Ala Pro Gly Val Asn Glu Met Ile Arg Ile Tyr Val Ala Gln Lys 850 855 860

Arg Lys Ile Gln Asp Gly Asp Lys Leu Ala Gly Arg His Gly Asn Lys 865 870 875 880

Gly Val Val Gly Lys Ile Leu Pro Gln Glu Asp Met Pro Phe Leu Pro 885 890 895

Asp Gly Thr Pro Val Asp Ile Ile Leu Asn Thr His Gly Val Pro Arg 900 905 910 Arg Met Asn Ile Gly Gln Val Leu Glu Thr His Leu Gly Trp Leu Ala 915 920 925

Ser Ala Gly Trp Ser Val Asp Pro Glu Asp Pro Glu Asn Ala Glu Leu 930 935 940

Val Lys Thr Leu Pro Ala Asp Leu Leu Glu Val Pro Ala Gly Ser Leu 945 950 955 960

Thr Ala Thr Pro Val Phe Asp Gly Ala Ser Asn Glu Glu Leu Ala Gly 965 970 975

Leu Leu Ala Asn Ser Arg Pro Asn Arg Asp Gly Asp Val Met Val Asn 980 985 990

Ala Asp Gly Lys Ala Thr Leu Ile Asp Gly Arg Ser Gly Glu Pro Tyr 995 1000 1005

Pro Tyr Pro Val Ser Ile Gly Tyr Met Tyr Met Leu Lys Leu His 1010 1015 1020

His Leu Val Asp Glu Lys Ile His Ala Arg Ser Thr Gly Pro Tyr 1025 1030 1035

Ser Met Ile Thr Gln Gln Pro Leu Gly Gly Lys Ala Gln Phe Gly 1040 1045 1050

Gly Gln Arg Phe Gly Glu Met Glu Val Trp Ala Met Gln Ala Tyr 1055 1060 1065

Gly Ala Ala Tyr Thr Leu Gln Glu Leu Leu Thr Ile Lys Ser Asp 1070 1075 1080

Asp Val Val Gly Arg Val Lys Val Tyr Glu Ala Ile Val Lys Gly 1085 1090 1095

Glu Asn Ile Pro Asp Pro Gly Ile Pro Glu Ser Phe Lys Val Leu 1100 1105 1110

Leu Lys Glu Leu Gln Ser Leu Cys Leu Asn Val Glu Val Leu Ser 1115 1120 1125

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Arg Ser Asp Ala Asp Thr Ala

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Corynebacterium glutamicum <213>

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1, 3 I IJ

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43

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mutation <221>

(2016)..(2016) <222>

Substitution of cytosine by thymine

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atc ttg gca gtc tcc cgc cag acc aag tca gtc gtc gat att ccc ggt

Ile Leu Ala Val Ser Arg Gln Thr Lys Ser Val Val Asp Ile Pro Gly

230

gca ccg cag cgt tat tct ttc gcg aag gtg tcc gca ccc att gag gtg 812 Ala Pro Gln Arg Tyr Ser Phe Ala Lys Val Ser Ala Pro Ile Glu Val ccc ggg cta cta gat ctt caa ctg gat tct tac tcc tgg ctg att ggt 860 Pro Gly Leu Leu Asp Leu Gln Leu Asp Ser Tyr Ser Trp Leu Ile Gly acg cet gag tgg cgt get egt cag aag gaa gaa tte gge gag gga gee 908 Thr Pro Glu Trp Arg Ala Arg Gln Lys Glu Glu Phe Gly Glu Gly Ala cgc gta acc age ggc ctt gag aac att ctc gag gag ctc tcc cca atc 956 Arg Val Thr Ser Gly Leu Glu Asn Ile Leu Glu Glu Leu Ser Pro Ile cag gat tac tot gga aac atg too otg ago ott tog gag oca ogo tto 1004 Gln Asp Tyr Ser Gly Asn Met Ser Leu Ser Leu Ser Glu Pro Arg Phe gaa gac gtc aag aac acc att gac gag gcg aaa gaa aag gac atc aac 1052 Glu Asp Val Lys Asn Thr Ile Asp Glu Ala Lys Glu Lys Asp Ile Asn tac gcg gcg cca ctg tat gtg acc gcg gag ttc gtc aac aac acc acc 1100 Tyr Ala Ala Pro Leu Tyr Val Thr Ala Glu Phe Val Asn Asn Thr Thr ggt gaa atc aag tot cag act gto tto atc ggc gat tto cca atg atg 1148 Gly Glu Ile Lys Ser Gln Thr Val Phe Ile Gly Asp Phe Pro Met Met 135 acg gac aag gga acg ttc atc atc gga acc gaa cgc gtt gtg gtc 1196 Thr Asp Lys Gly Thr Phe Ile Ile Asn Gly Thr Glu Arg Val Val Val 155 age cag etc gtc ege tec eeg gge gtg tae ttt gae eag ace ate gat 1244 Ser Gln Leu Val Arg Ser Pro Gly Val Tyr Phe Asp Gln Thr Ile Asp 170 aag tca act gag cgt cca ctg cac gcc gtg aag gtt att cct tcc cgt 1292 Lys Ser Thr Glu Arg Pro Leu His Ala Val Lys Val Ile Pro Ser Arg 185 ggt gct tgg ctt gag ttt gac gtc gat aag cgc gat tcg gtt ggt gtt 1340 Gly Ala Trp Leu Glu Phe Asp Val Asp Lys Arg Asp Ser Val Gly Val 200 205 cgt att gac cgc aag cgt cgc cag cca gtc acc gta ctg ctg aag gct 1388 Arg Ile Asp Arg Lys Arg Gln Pro Val Thr Val Leu Leu Lys Ala 215 220 ctt ggc tgg acc act gag cag atc acc gag cgt ttc ggt ttc tct gaa 1436 Leu Gly Trp Thr Thr Glu Gln Ile Thr Glu Arg Phe Gly Phe Ser Glu

15

20

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	gca Ala	ttg Leu	ctg Leu	gag Glu 265	atc Ile	tac Tyr	cgc Arg	aag Lys	cag Gln 270	cgt Arg	cca Pro	ggc Gly	gag Glu	cag Gln 275	cct Pro	acc Thr	1532
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aac Asn	gag Glu 855	atg Met	atc Ile	cgt Arg	atc Ile	tac Tyr 860	gtt Val	gct Ala	cag Gln	aag Lys	cgt Arg 865	Lys	atc Ile	cag Gln	gac Asp	3308
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gac Asp	atc Ile	atc Ile	ttg Leu 905	aac Asn	acc Thr	cac His	ggt Gly	gtt Val 910	cca Pro	cgt Arg	cgt Arg	atg Met	aac Asr 915	ı Ile	ggt Gly	3452
cag Gln	gtt Val	ctt Leu	gag Glu	acc Thr	cac His	ctt Leu	ggc Gly	tgg Trp	ctg Leu	gca Ala	tct Ser	gct Ala	ggt Gly	tgg Trp	tcc Ser	3500

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4	acg Thr	ctt Leu	atc Ile 1000	gac Asp	ggt Gly	cgc Arg	tcc Ser	ggt Gly 1005	gag Glu	cct Pro	tac Tyr	ccg Pro	tac Tyr 1010	ccg Pro	gtt Val	3737
	tcc Ser	atc Ile	ggc Gly 1015	tac Tyr	atg Met	tac Tyr	atg Met	ctg Leu 1020	aag Lys	ctg Leu	cac His	cac His	ctc Leu 1025	gtt Val	gac Asp	3782
	gag Glu	aag Lys	atc Ile 1030	cac His	gca Ala	cgt Arg	tcc Ser	act Thr 1035	ggt Gly	cct Pro	tac Tyr	tcc Ser	atg Met 1040	att Ile		3827
	cag Gln	cag Gln	cca Pro 1045	ctg Leu	ggt Gly	ggt Gly	aaa Lys	gca Ala 1050	Gln	ttc Phe	ggt Gly	gga Gly	cag Gln 1055	cgt Arg	ttc Phe	3872
7	ggc Gly	gaa Glu	atg Met 1060	Glu	gtg Val	tgg Trp	gca Ala	atg Met 1065	Gln	gca Ala	tac Tyr	ggc Gly	gct Ala 1070	gcc Ala	tac Tyr	3917
	aca Thr	ctt Leu	cag Gln 1075	Glu	ctg Leu	ctg Leu	acc Thr	atc Ile 1080	Lys	tct Ser	gat Asp	gac Asp	gtg Val 1085	gtt Val	ggc Gly	3962
	cgt Arg	gtc Val	aag Lys 1090	Val	tac Tyr	gaa Glu	gca Ala	att Ile 1095	Val	aag Lys	ggc Gly	gag Glu	aac Asn 1100	Ile	ccg Pro	4007
	gat Asp	cca Pro	ggt Gly 1105	Ile	cct Pro	gag	tcc Ser	ttc Phe 1110	Lys	gtt Val	ctc Leu	ctc Leu	aag Lys 1115	Glu	ctc Leu	4052
	cag Gln	tcc Ser	ttg Leu 1120	Cys	ctg Leu	aac Asr	gtg Val	gag Glu 1125	٧al	ctc Leu	tcc Ser	gca Ala	gac Asp 1130	Gly	act Thr	4097
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gcc tca cti Ala Ser Lei 11!	a Gly Ile A	aac ctg tcc Asn Leu Ser 1155	Arg Asp Gl		gac gcc Asp Ala	4187
gac acc gca Asp Thr Ala	a	ca gaaaacaac	cc gctagaaat	c aagccatad	ca	4236
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<213> Corynebacterium glutamicum

Val Leu Glu Gly Pro Ile Leu Ala Val Ser Arg Gln Thr Lys Ser Val 5 1 10

Val Asp Ile Pro Gly Ala Pro Gln Arg Tyr Ser Phe Ala Lys Val Ser 20 25 30

Ala Pro Ile Glu Val Pro Gly Leu Leu Asp Leu Gln Leu Asp Ser Tyr 35 40

Ser Trp Leu Ile Gly Thr Pro Glu Trp Arg Ala Arg Gln Lys Glu Glu 50 55 60

Phe Gly Glu Gly Ala Arg Val Thr Ser Gly Leu Glu Asn Ile Leu Glu 65 70 75 80

Glu Leu Ser Pro Ile Gln Asp Tyr Ser Gly Asn Met Ser Leu Ser Leu 85 90 95

Ser Glu Pro Arg Phe Glu Asp Val Lys Asn Thr Ile Asp Glu Ala Lys
100 105 110

Glu Lys Asp Ile Asn Tyr Ala Ala Pro Leu Tyr Val Thr Ala Glu Phe 115 120 125

Val Asn Asn Thr Thr Gly Glu Ile Lys Ser Gln Thr Val Phe Ile Gly 130 135 140

Asp Phe Pro Met Met Thr Asp Lys Gly Thr Phe Ile Ile Asn Gly Thr 145 150 155 160

Glu Arg Val Val Ser Gln Leu Val Arg Ser Pro Gly Val Tyr Phe
165 170 175

Asp Gln Thr Ile Asp Lys Ser Thr Glu Arg Pro Leu His Ala Val Lys
180 185 190

Val Ile Pro Ser Arg Gly Ala Trp Leu Glu Phe Asp Val Asp Lys Arg 195 200 205

Asp Ser Val Gly Val Arg Ile Asp Arg Lys Arg Arg Gln Pro Val Thr 210 215 220

Val Leu Leu Lys Ala Leu Gly Trp Thr Thr Glu Gln Ile Thr Glu Arg 225 230 235 240

Phe Gly Phe Ser Glu Ile Met Met Ser Thr Leu Glu Ser Asp Gly Val 245 250 255

Ala Asn Thr Asp Glu Ala Leu Leu Glu Ile Tyr Arg Lys Gln Arg Pro 260 265 270 Gly Glu Gln Pro Thr Arg Asp Leu Ala Gln Ser Leu Leu Asp Asn Ser 275 280 285

Phe Phe Arg Ala Lys Arg Tyr Asp Leu Ala Arg Val Gly Arg Tyr Lys 290 295 300

Ile Asn Arg Lys Leu Gly Leu Gly Gly Asp His Asp Gly Leu Met Thr 305 310 315 320

Leu Thr Glu Glu Asp Ile Ala Thr Thr Ile Glu Tyr Leu Val Arg Leu 325 330 335

His Ala Gly Glu Arg Val Met Thr Ser Pro Asn Gly Glu Glu Ile Pro $340 \hspace{1.5cm} 345 \hspace{1.5cm} 350$

Val Glu Thr Asp Asp Ile Asp His Phe Gly Asn Arg Arg Leu Arg Thr 355 360 365

Val Gly Glu Leu Ile Gln Asn Gln Val Arg Val Gly Leu Ser Arg Met $370 \hspace{1cm} 375 \hspace{1cm} 380$

Glu Arg Val Val Arg Glu Arg Met Thr Thr Gln Asp Ala Glu Ser Ile 385 390 395 400

Thr Pro Thr Ser Leu Ile Asn Val Arg Pro Val Ser Ala Ala Ile Arg
405 410 415

Glu Phe Phe Gly Thr Ser Gln Leu Ser Gln Phe Met Asp Gln Asn Asn 420 425 430

Ser Leu Ser Gly Leu Thr Tyr Lys Arg Arg Leu Ser Ala Leu Gly Pro 435 440 445

Gly Gly Leu Ser Arg Glu Arg Ala Gly Ile Glu Val Arg Asp Val His
450 455 460

Pro Ser His Tyr Gly Arg Met Cys Pro Ile Glu Thr Pro Glu Gly Pro 465 470 475 480

Asn Ile Gly Leu Ile Gly Ser Leu Ala Ser Tyr Ala Arg Val Asn Pro 485 490 495

Phe Gly Phe Ile Glu Thr Pro Tyr Arg Arg Ile Ile Asp Gly Lys Leu
500 505 510

Thr Asp Gln Ile Asp Tyr Leu Thr Ala Asp Glu Glu Asp Arg Phe Val 515 520 525

Val Ala Gln Ala Asn Thr His Tyr Asp Glu Glu Gly Asn Ile Thr Asp 530 535 540

Glu Thr Val Thr Val Arg Leu Lys Asp Gly Asp Ile Ala Met Val Gly 545 550 555

Arg Asn Ala Val Asp Tyr Met Asp Val Ser Pro Arg Gln Met Val Ser 565 570 575

Val Gly Thr Ala Met Ile Pro Phe Leu Glu His Asp Asp Ala Asn Arg 580 585 590

Ala Leu Met Gly Ala Asn Met Gln Lys Gln Ala Val Pro Leu Ile Arg 595 600 605

Ala Glu Ala Pro Phe Val Gly Thr Gly Met Glu Gln Arg Ala Ala Tyr 610 620

Asp Ala Gly Asp Leu Val Ile Thr Pro Val Ala Gly Val Val Glu Asn 625 630 640

Val Ser Ala Asp Phe Ile Thr Ile Met Ala Asp Asp Gly Lys Arg Glu 645 650 655

Thr Tyr Leu Leu Arg Lys Phe Gln Arg Thr Asn Gln Gly Thr Ser Tyr 660 665 670

Asn Gln Lys Pro Leu Val Asn Leu Gly Glu Arg Val Glu Ala Gly Gln 675 680 685

Val Ile Ala Asp Gly Pro Gly Thr Phe Asn Gly Glu Met Ser Leu Gly 690 695 700

Arg Asn Leu Leu Val Ala Phe Met Pro Trp Glu Gly His Asn Tyr Glu 705 710 715 720

Asp Ala Ile Ile Leu Asn Gln Asn Ile Val Glu Gln Asp Ile Leu Thr

Ser Ile His Ile Glu Glu His Glu Ile Asp Ala Arg Asp Thr Lys Leu $740 \hspace{1.5cm} 745 \hspace{1.5cm} 750$

Gly Ala Glu Glu Ile Thr Arg Asp Ile Pro Asn Val Ser Glu Glu Val
755 760 765

Leu Lys Asp Leu Asp Asp Arg Gly Ile Val Arg Ile Gly Ala Asp Val 770 780

Arg Asp Gly Asp Ile Leu Val Gly Lys Val Thr Pro Lys Gly Glu Thr 785 790 795 800

Glu Leu Thr Pro Glu Glu Arg Leu Leu Arg Ala Ile Phe Gly Glu Lys 805 810 815

Ala Arg Glu Val Arg Asp Thr Ser Met Lys Val Pro His Gly Glu Thr $820 \\ 825 \\ 830$

Gly Lys Val Ile Gly Val Arg His Phe Ser Arg Glu Asp Asp Asp Asp 835 840 845

Leu Ala Pro Gly Val Asn Glu Met Ile Arg Ile Tyr Val Ala Gln Lys 850 860

Arg Lys Ile Gln Asp Gly Asp Lys Leu Ala Gly Arg His Gly Asn Lys 865 870 875 880

Gly Val Val Gly Lys Ile Leu Pro Gln Glu Asp Met Pro Phe Leu Pro 885 890 895

Asp Gly Thr Pro Val Asp Ile Ile Leu Asn Thr His Gly Val Pro Arg

Arg Met Asn Ile Gly Gln Val Leu Glu Thr His Leu Gly Trp Leu Ala 915 920 925

Ser Ala Gly Trp Ser Val Asp Pro Glu Asp Pro Glu Asn Ala Glu Leu 930 935 940

Val Lys Thr Leu Pro Ala Asp Leu Leu Glu Val Pro Ala Gly Ser Leu 945 950 955 960 Thr Ala Thr Pro Val Phe Asp Gly Ala Ser Asn Glu Glu Leu Ala Gly 965 970 975

Leu Leu Ala Asn Ser Arg Pro Asn Arg Asp Gly Asp Val Met Val Asn 980 985 990

Ala Asp Gly Lys Ala Thr Leu Ile Asp Gly Arg Ser Gly Glu Pro Tyr 995 1000 1005

Pro Tyr Pro Val Ser Ile Gly Tyr Met Tyr Met Leu Lys Leu His 1010 1015 1020

His Leu Val Asp Glu Lys Ile His Ala Arg Ser Thr Gly Pro Tyr 1025 1030 1035

Ser Met Ile Thr Gln Gln Pro Leu Gly Gly Lys Ala Gln Phe Gly 1040 1045 1050

Gly Gln Arg Phe Gly Glu Met Glu Val Trp Ala Met Gln Ala Tyr 1055 1060 1065

Gly Ala Ala Tyr Thr Leu Gln Glu Leu Leu Thr Ile Lys Ser Asp 1070 1075 1080

Asp Val Val Gly Arg Val Lys Val Tyr Glu Ala Ile Val Lys Gly 1085 1090 1095

Glu Asn Ile Pro Asp Pro Gly Ile Pro Glu Ser Phe Lys Val Leu 1100 1105 1110

Leu Lys Glu Leu Gln Ser Leu Cys Leu Asn Val Glu Val Leu Ser 1115 1120 1125

Ala Asp Gly Thr Pro Met Glu Leu Ala Gly Asp Asp Asp Phe 1130 1135 1140

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Arg Ser Asp Ala Asp Thr Ala 1160 1165

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tcggtt	aagg t	caġtggc	ga gct	tctttg	tgg	ttcg	ttt	cctt	gagg	aa c	agtc	atggg	180
aaccat	tcta a	caaggga	tt tgg	gtgtttt	tgc	ggct	agc	tgat	aatg	tg a	acgg	ctgag	240
tcccac	tctt g	tagttgg	ga att	gacggca	a cct	cgca	ctc	aagc	gcgg	ta t	cgcc	cctgg	300
ttttcc	ggga c	gcggtgg	cg cat	gtttgca	a ttt	gatg	agg	ttgt	ccgt	ga c	atgt	ttggt	360
cgggcc	ccaa a	aagagcc	cc ctt	tttttgc	g tgt	.ctgg	aca	cttt	ttca	aa t	cctt	cgcca	420
tcgaca	agct c	agccttc	gt gtt	tegtece	c cgg	gcgt	cac	gtca	.gcag	tt a	aaga	acaac	480
tccgaa	ataa g	gatggtt	c atg Met 1	cca act	t att	cag Gln 5	cag Glr	g ctg Leu	gto Val	cgt Arg	aag Lys 10	ggc Gly	532
cgc ca Arg Hi	c gat s Asp	aag tcc Lys Ser 15	gcc a	aag gtg Lys Val	gct Ala 20	acc Thr	gcg Ala	gca Ala	ctg Leu	aag Lys 25	ggt Gly	tcc Ser	580
Arg Hi	s Asp	Lys Ser	Ala 1	Lys Val	Ala 20 cgt	Thr	Ala	Ala	Leu	Lys 25 acc	Gly	Ser	580 628
Arg Hi	g cgt n Arg 30 et aac	Lys Ser 15 cat agc	gta to val o	Lys Val tgc acc Cys Thr 35 cqt aag	Ala 20 cgt Arg	Thr gtg Val gct	Ala tac Tyr	Ala acc Thr	acc Thr 40	Lys 25 acc Thr	cct Pro	aag Lys tcc	
aag collys Production at the state of the st	g cgt n Arg 30 t aac o Asn	Lys Ser 15 cgt ggc Arg Gly tct qct	gta (Val Cott)	tgc acc Cys Thr 35 cgt aag Arg Lys tac atc	Ala 20 cgt Arg gtc Val	Thr gtg Val gct Ala ggt	tac Tyr cgt Arg	Ala acc Thr gtg Val 55	acc Thr 40 cgc Arg	Lys 25 acc Thr ctt Leu	cct Pro acc Thr	aag Lys tcc Ser	628
aag collys Production 45 ggc at Gly Il	g cgt n Arg 30 et aac o Asn c gag e Glu	Lys Ser 15 cgt ggc Arg Gly tct gct Ser Ala	gta de Val de Va	tgc acc Cys Thr 35 cgt aag Arg Lys 50 tac atc Tyr Ile	Ala 20 cgt Arg gtc Val cct Pro	Thr gtg Val gct Ala ggt Gly	tac Tyr cgt Arg gag Glu 70	Ala acc Thr gtg Val 55 ggc Gly	acc Thr 40 cgc Arg cac His	Lys 25 acc Thr ctt Leu aac Asn	CCT Pro acc Thr ctg Leu	aag Lys tcc Ser cag Gln 75	628 676

aag gac cgc aag cag gct cgt tcc ccg cta cgg cgc gaa gag Lys Asp Arg Lys Gln Ala Arg Ser Pro Leu Arg Arg Glu Glu 110 115 120	ggg ata 868 Gly Ile
att aaa aat gcg taaatcagca gctcctaagc gtccagtagt tcaggac Ile Lys Asn Ala 125	ecct 920
gtatacaagt ccgagctcgt tacccagctc gtaaacaaga tcctcatcgg t	ggcaagaag 980
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<212> PRT

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Val Cys Thr Arg Val Tyr Thr Thr Pro Lys Lys Pro Asn Ser Ala 35 40 45

Leu	Arg 50	Lys	Val	Ala	Arg	Val 55	Arg	Leu	Thr	Ser	Gly 60	Ile	Glu	Val	Ser	
Ala 65	Tyr	Ile	Pro	Gly	Glu 70	Gly	His	Asn	Leu	Gln 75	Glu	His	Ser	Met	Val 80	
Leu	Val	Arg	Gly	Gly 85	Arg	Val	Lys	Asp	Leu 90	Pro	Gly	Val	Arg	Tyr 95	Lys	
Ile	Val	Arg	Gly 100	Ala	Leu	Asp	Thr	Gln 105	Gly	Val	Lys	Asp	Arg 110	Lys	Gln	
Ala	Arg	Ser 115	Pro	Leu	Arg	Arg	Glu 120	Glu	Gly	Ile	Ile	Lys 125	Asn	Ala		
	l> 2 2> I	9 24 ONA ARTIF	rici <i>i</i>	AL SE	EQUEN	ICE										
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